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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Paolo Matteazzi

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EXAMINER

ZHU, WEIPING

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

08/26/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/581,324	Applicant(s) MATTEAZZI ET AL.	
	Examiner WEIPING ZHU	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2009 and 01 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 14-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) 5-13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. Claims 1-13 are currently under examination, wherein no claim has been amended in applicant's reply filed on June 26, 2009. Applicant's affirmation of the election without traverse of Invention I, Claims 1-13 in the reply filed on June 26, 2009 is acknowledged. The non-elected Inventions II and III, Claim 14-30, has been withdrawn from consideration by the examiner.

Claim Objections

2. Claims 6-13 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only, and/or, cannot depend on any other multiple dependent claims. See MPEP § 608.01(n). Accordingly, claims 6 and 8-13 and the dependent claim 7 of claim 6 have not been further treated on the merits.

Claim 4 is objected to because the limitation on the width of the heating flux should not include smaller than 20 μm (i.e. the majority in weight of the particle size distribution), because claim 4 depends on claim 1 which limits the width of the heating flux being not smaller than the majority in weight of the particle size distribution.

Claim 5 is objected to because an "at" should be inserted between "with" and "least" in line 3.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keicher et al. (US 6,391,251 B1) in view of Jang et al. (US 6,401,001 B1).

With respect to claims 1 and 4, Keicher et al. ('251 B1) discloses a method for fabrication a three-dimensional solid object by sintering metallic (i.e. inorganic as claimed) particles with a controlled size distribution comprising directing at least one powdery stream of the particles and at least one heating flux simultaneously to the surface of a substrate (i.e. a rigid target area as claimed) while an at least bidimensional relative movement is maintained between the substrate, the powdery stream and the heating flux, wherein the powdery stream is contained in a conical surface having as its axis the direction of the heating flux and its vertex onto the substrate (abstract, Fig. 11, col. 13, lines 39-67, col. 16, lines 31-49 and col. 21 lines 29-53). Keicher et al. ('251 B1) does not disclose that the width of the heating flux is not smaller than (i.e. greater than or equal to) the majority in weight of the particle size distribution as claimed in claims 1 and 4. Jang et al. ('001 B1) discloses a solid freeform fabrication process for making a three-dimensional object comprising operating a focused energy beam (e.g. a laser beam) to produce a fusion zone through which the powder particles in micron, submicron or nanometer sizes, which reads on the particle dimensional distribution of about 90% in weight of the particles having a size of 0.5 to 20 μm as claimed in claim 4, are melted while in flight, thereby producing liquid droplets traveling to deposit onto a target surface, wherein the deposition spot size, which essentially controls the part

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accuracy, is governed by the powder flow size and the laser beam size whichever being smaller; and that as a special case, the powder may be dispensed one particle a time and, therefore, the part accuracy can be as good as the particle size (abstract and col. 10, lines 42-64). The disclosure of Jang et al. ('001 B1) indicates that the part accuracy is advantageously governed by the particle size suggesting that the laser beam size is greater than the particle size representing the majority in weight of the particle size distribution as claimed. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use particles in micron, submicron or nanometer sizes as desired, which are smaller than that of the laser beam in the process of Keicher et al. ('251 B1) as disclosed by Jang et al. ('001 B1) in order to obtain the part accuracy as desired as disclosed by Jang et al. ('001 B1) (col. 10, lines 42-64).

With respect to claim 3, Keicher et al. ('251 B1) in view of Jang et al. ('001 B1) does not specify that the width of the heating flux onto the target area does not exceed 150 microns as claimed. However, it is well held that discovering an optimum value of a result-effective variable involves only routine skill in the art. In re Boesch, 617, F.2d 272, 205 USPQ 215 (CCPA 1980). In the instant case, the focused laser spot diameter is a result effective variable, because it would directly affect the properties of the deposited material as disclosed by Keicher et al. ('251 B1) (col. 14, lines 43-59). Therefore it would have been obvious to one skilled in the art to have optimized the focused laser spot diameter of Keicher et al. ('251 B1) in view of Jang et al. ('001 B1) for the desired properties of the deposited material. See MPEP 2144.05 II.

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With respect to claim 5, Keicher et al. ('251 B1) discloses a flow of powder is entrained in a gas vehicle (col. 19, lines 26-49), forming a solid aerosol as claimed. Keicher et al. ('251 B1) in view of Jang et al. ('001 B1) does not specify that the particles consist of agglomerated crystallites of a size lower than 10^{-7} m as claimed. However, one of ordinary skill in the art would expect the same properties of the deposited material using the particles of Keicher et al. ('251 B1) in view of Jang et al. ('001 B1) or the claimed particles, because the properties would directly be affected by the composition, size and size distribution of the particles as disclosed by Keicher et al. ('251 B1) (col. 13, lines 56-65 and col. 14 lines 43-59); the method of making the particles (e.g. atomization or agglomeration) would have little effects on the properties.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Keicher et al. ('251 B1) in view of Jang et al. ('001 B1) as applied to claim 1 above and further in view of Krause et al. (US 5,321,228 A).

With respect to claim 2, Keicher et al. ('251 B1) in view of Jang et al. ('001 B1) does not disclose that the vertex angle of the conical surface formed by the powdery stream does not exceed 45° . Krause et al. ('228 A) discloses a similar process using a laser beam to melt a flow of powders to form a melting bath on a substrate wherein the angle of the conical surface formed by the powdery stream lies between 28° and 45° (abstract and col. 3, lines 6-12). It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the angle as disclosed by Krause et al. ('288 A) in the apparatus of Keicher et al. ('251 B1) in view of Jang et al. ('001 B1) in

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order to reduce directional dependency in laser spray coating as disclosed by Krause et al. ('228 A) (col. 2, lines 3-15).

Conclusions

5. This Office action is made non-final. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Weiping Zhu whose telephone number is 571-272-6725. The examiner can normally be reached on 8:30-16:30 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art
Unit 1793

WZ

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